

HEAT INJURIES

MANSCEN Safety Office

OBJECTIVES

1. Know Individual risk factors.
2. Proper Acclimatization.
3. Know types of heat injuries, and first aid.
4. Be able to read and obtain WBGT index.

A. INDIVIDUAL RISK FACTORS

1. Illness
2. Immunization
3. Previous heat injury
4. Skin trauma
5. Dehydration

INDIVIDUAL RISK FACTORS (cont)

6. Fatigue
7. Obesity
8. Poor physical condition
9. Level of acclimatization
10. Consumption of alcohol and drugs

INDIVIDUAL RISK FACTORS (cont)

11. Persons with fair or light skin
12. Improper eating

B. ACCLIMATIZATION

1. Definition: The process by which an individual becomes able to tolerate work in an environment.

ACCLIMATIZATION

2. Weather conditions and types:
 - a. Conditions - Air temperature, wind, clouds
 - b. Hot humid - Tropical or jungle
 - c. Hot dry - Desert

3. LENGTH OF TIME REQUIRED

- a. Achieved in 10 days to two weeks
- b. Progressive degrees of heat exposure
- c. Full acclimatization - two 50 minute periods of work a day
- d. Heaviest work load done in cooler times of day

II. TYPES OF HEAT INJURIES

A. Sunburn

1. Damaging outer layer of skin by exposure to ultra-violet rays
2. Symptoms
 - a. Redness of the skin

TYPES OF HEAT INJURIES

(cont)

2. Symptoms (cont)
 - b. Sensitive skin
 - c. Blistering

TYPES OF HEAT INJURIES

(cont)

3. First Aid
 - a. 1st degree burns - cooling lotions
 - b. 2nd and 3rd degree burns
 - (1) Keep skin clean (preferably uncovered)
 - (2) Blisters - Should not be broken
 - (3) Avoid further exposure to sun

4. PREVENTION

- a. Cover skin - Use sunblock
- b. Individuals with fair to light skin
need to be extra careful

B. HEAT CRAMPS

1. Definition: Painful contractions of limb, abdominal or back muscles caused by loss of salt through profuse sweating.

B. HEAT CRAMPS (cont)

2. Symptoms: Contractions of large muscle groups.
 - a. Trunk
 - b. Legs
 - c. Abdominal

3. FIRST AID FOR HEAT CRAMPS

- a. Move casualty to cool or shady area or improvise shade.
- b. Loosen clothing unless in a chemical environment.

FIRST AID (cont)

- c. Slowly drink at least 1 quart of cool water
- d. Seek medical aid if cramps continue

4. PREVENTION

- a. Adequate intake of water (small amounts frequently)
- b. Salting of foods - There is no need to add extra amount of salt to food.

C. HEAT EXHAUSTION

1. Definition: An inability to continue work in the heat due to a collapse of the blood vessels near the skin's surface.

HEAT EXHAUSTION

2. Symptoms:

- a. Profuse sweating
- b. Headache
- c. Tingling sensation in extremities
- d. Pale, moist, cool skin

HEAT EXHAUSTION

SYMPTOMS (cont)

- e. Rapid, weak pulse
- f. Shortness of breath
- g. Abdominal cramps
- h. Weakness

HEAT EXHAUSTION

SYMPTOMS (cont)

- i. Loss of coordination
- j. Confused or drowsy
- k. Possible loss of consciousness

3. FIRST AID

- a. Remove person from sun - place in shade or cool place
- b. Elevate legs above level of head
- c. Remove all excess clothing, boots, and equipment

FIRST AID (cont)

- d. Give water by mouth if conscious
- e. Pour water on casualty, massage limbs, and fan.
- f. Monitor casualty

4. PREVENTION

- a. Use of work/rest cycles
- b. Proper water consumption
- c. Proper diet - to maintain chemical balance

D. HEAT STROKE (SUNSTROKE)

1. Definition: A MEDICAL EMERGENCY when the body is unable to regulate its own temperature. The body loses its ability to dissipate heat.

HEAT STROKE (cont)

2. Symptoms:
 - a. Headache
 - b. Overall bad feeling
 - c. Excessive warmth
 - d. Sudden loss of consciousness

SYMPTOMS (cont)

- e. Convulsions or delirium
- f. Sweating may or may not be present
- g. Skin hot and dry
- h. Pulse is full and rapid

HEAT STROKE

3. First Aid

- a. Move person to a cool area or provide shade.
- b. Remove the outer garments and equipment
- c. Pour water over casualty, rub limbs, and fan.

FIRST AID (cont)

- d. Elevate casualty's legs
- e. Start IV (Medical emergency
**SEEK IMMEDIATE MEDICAL
ATTENTION**)

4. PREVENTION

- a. Be aware of susceptible persons.
- b. Use work/rest cycles
- c. Proper water consumption
- d. Proper diet
- e. Heaviest work should be performed in cooler times of the day

III. HEAT GUIDELINES

A. Wet Bulb Globe Temperature

1. Definition: A process of monitoring the effect of the wind, radiant heat from the sun, and humidity on activity in hot environments. It is comprised of 3 measurements:

WBGT (cont)

- a. A stationary **wet bulb** thermometer exposed to the sun and wind.
- b. A six-inch **black globe** thermometer similarly exposed.
- c. A **dry bulb** thermometer shielded from direct sunlight.

2. UTILIZATION

- * Combining the three temperatures will provide a more accurate representation of the heat stress on the body

3. MEASUREMENT OF WBGT

1. $WBGT = 0.7 \times \text{wet bulb temperature} + 0.2 \times \text{black globe temperature} + 0.1 \times \text{shaded dry bulb temperature}$
2. Add all three to get Heat Index
3. Use the Heat Index to obtain the Heat Category

IV. COMMAND EDUCATION INFORMATION

A. UNIFORM

1. No starch
2. Wear as little clothing as possible
3. Clothing loose fitting, trousers unbloused
4. No wearing of impervious, air-tight material (rubber, plastic)

B. WATER POLICIES

1. Liberal intake
2. Adequate water intake is the most important factor in reducing heat injuries
3. Soldiers cannot be taught to adjust to decreased water intake

WATER POLICIES (cont)

4. **Thirst** should not be used as an indicator for water intake
5. Enforce water consumption
6. Do not try to save water by decreasing water consumption

REVIEW OF MAIN POINTS

- ◆ Risk Factors
- ◆ Types of Heat Injuries
- ◆ WBGT
- ◆ Command Information

